

RESEARCH NOTES

NOTES ON THE CAUSES OF DISCOLORED WATER ALONG THE SOUTHWESTERN COAST OF FLORIDA¹

Heavy rains and flooding of low-lying coastal areas in southern Florida during the early part of March, 1960, caused many of the estuaries, bays, passes and inshore areas to become discolored with runoff and erosion products from shore. This was especially true in the Tampa Bay area. In addition to physical discoloration of seawater along the southwestern coast of Florida other causes of discoloration which are biological in origin are frequently noted in the same area. Hutton (1956, Quart. Journ. Fla. Acad. Sci. 19(2): 123-146), summarized the known biological causes of discolored water in the coastal waters of Florida.

A species of dinoflagellate, *Gymnodinium breve* Davis, periodically increases in number and discolors coastal waters of the southwestern part of Florida. This phenomenon is popularly known as "Red Tide". Fish-kills are commonly associated with this phenomenon. A species of blue-green alga, *Skujaella (Trichodesmium) thiebauti* De Toni, also commonly discolors the southwestern coastal waters of Florida. Boat captains, airplane pilots and others frequently report discolorations caused by *S. thiebauti* as "Red Tide", but fish-kills caused by this alga are not known from the area.

During the early part of the year 1960 three causes of discolored water, biological in origin, were noted in the coastal waters of southwestern Florida. They are recorded as follows:

PROTOZOA

Dinoflagellata

1. *Gymnodinium breve* Davis, 1948.

This dinoflagellate was responsible for discolored inshore waters and fish-kills between Cape Romano and Englewood during the first three weeks of January. Water samples taken in the area by agents of the Florida State Board of Conservation and examined by biologists of the same Department revealed "counts" of as high as 7,000,000 cells per liter.

Mr. B. Z. May, U. S. Fish and Wildlife Service, St. Petersburg Beach, Florida, (personal communication) reported discolored water and dead fish associated with high concentrations of *G. breve* from 15 to 35 miles west of Egmont Key on 23 March 1960. One water sample collected from this area and examined by a U. S. Fish and Wildlife Service Biologist (personal communication) contained more than 6,000,000 cells per liter.

2. *Gymnodinium splendens* Lebour, 1925.

Mr. Joseph Humphries, of this laboratory noted discolored water covering an area of several square miles in Tampa Bay south of Gandy Bridge on 27 March. A water sample collected from the discolored area by Mr. Humphries was examined by me and the agent responsible for the discoloration identified

¹ Contribution No. 45, Fla. St. Bd. Conserv. Mar. Lab.

as *G. splendens*. Although more than 5,000,000 cells per liter were present in the water sample there was no apparent damage to fish life.

ARTHROPODA

Crustacea

3. *Acartia tonsa* Dana, 1849, and *Labidocera aestiva* Wheeler, 1900.

Two commercial fishermen, Mr. Ross Black and Mr. Herman Reisler, Sarasota, (personal communication) reported noting a streak of reddish brown discolored water in the Gulf of Mexico one and one-half miles west of Big Sarasota Pass at 11:00 A.M., 29 March. It was approximately one mile in width and extended towards the beach. Dead fish were not present in the area and mackerel were frequently seen jumping from the water by Messrs. Black and Reisler. I examined a water sample collected by Messrs. Black and Reisler. It contained more than 350,000 copepods per liter of the species identified as *A. tonsa*. This identification was confirmed by Dr. Thomas E. Bowman, United States National Museum, Washington, D. C., who identified a second species of copepod from the water sample as *L. aestiva*. This second species was much less abundant than *A. tonsa*.—ROBERT F. HUTTON, Florida State Board of Conservation Marine Laboratory. St. Petersburg, Florida. Quart. Journ. Fla. Acad. Sci., 23(2), 1960

A NOTE ON THE OCCURRENCE OF THE SHRIMP, *PENAEUS BRASILIENSIS* LATREILLE, IN BISCAYNE BAY, FLORIDA¹

In recent reports on shrimp investigations of Biscayne Bay, Sibenaler (1953, Fla. St. Bd. Conserv., Tech. Ser. No. 6: 1-20); Higman (1956, Fla. St. Bd. Conserv., Tech. Ser. No. 16: 1-23); Costello (1958, Gulf Fishery Investigations, Annual Report, U. S. Fish and Wildlife Service: 32-35); and Costello and Allen (1959, Gulf Fishery Investigations, Annual Report, U. S. Fish and Wildlife Service: 13-18) mention only one species, *Penaeus duorarum* in this area.

However, three samples of shrimp obtained from Biscayne Bay showed two closely related grooved species, *P. duorarum* and *P. brasiliensis*. No authentic previous record of the occurrence of *P. brasiliensis* from this area is evident in the literature. Burkenroad (1934, Bull. Amer. Mus. Nat. Hist. 68(2): 61-143) confined the grooved North and South American specimens of *Penaeus* under the name of *P. brasiliensis* and reported a wide distribution for this species ranging on the east coasts of the Americas from about 41° north to 32° south latitude.

Burkenroad's (1939, Bull. Bingham Oceanog. Coll. 6(art. 6): 1-62) further studies of the North American specimens of Division II of *Penaeus* established three distinct species from this *P. brasiliensis* complex: *P. aztecus* (Form A) distribution Gulf of Mexico and Atlantic North America; *P. duorarum* (Form A) distribution Gulf of Mexico, Atlantic North America, and Bermuda; and *P. brasiliensis*, distribution Atlantic North America (based on one specimen

¹ Contribution No. 47, Fla. St. Bd. Conserv. Mar. Lab.